

Revision of the Species of Pleonectyptera Grt.

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(Plate XI)

This genus was described by Mr. Grote in 1872 (TRANS. AMER. ENT. SOC., iv, 23, and two new species, *geometralis* Grt. and *phalaenalis* Grt. were associated with *Hemeroplanis pyralis* Hbn., to make it up. At about the same time, though published a little later, Zeller described his genus *Coptocnemia* in the Verhandlungen de k. k. Zool. bot. Gesellschaft, xxii, 476, and on pl. 1, fig. 19, figured some of the structural peculiarities of his species *floccalis*. The type of that species I saw later, at Cambridge, and found it to be the same as the species identified as *pyralis* by Mr. Grote.

The generic characters are: eyes naked, large, globose, without overhanging ciliae or lashes. Front normally convex, not specially modified; vestiture hairy and tending to form a little pointed frontal tuft, enhancing the snout-like effect of the palpal structure. Palpi oblique, the second joint longest, clavate, a little flattened transversely, the tip obliquely truncate, but with the angles rounded; terminal joint moderate, cylindrical, obtusely terminated, set into the second joint so as to project straight forward or even to droop a little. Tongue well developed, functional. Antennæ simple in both sexes or with moderate ciliations in the male. Thorax small, convex; collar and patagia not marked, closely appressed; vestiture flattened hair and scales, smooth, forming no tufts. Abdomen cylindrical, elongate, tapering, well extended beyond the hind angles of the secondaries, closely scaled, without dorsal or lateral tuftings. Legs long, slender, unarmed, except for the usual spurs of mid and hind tibiae, the latter not spinose. In the males the middle or posterior tibiae may or may not be thickened and provided with sexual tufts, and at the base of the abdomen in the same sex there may or may not be a pair of lateral hair pencils. Wings proportionate, closely scaled; primaries, veins 3, 4, 5 well separated from end of median, 6 almost directly continuing subcostal from the lower angle of accessory cell, 7 and 8 from end of accessory cell, 9 out of 8 near apex, 10 out of upper angle of accessory cell. In the males of some species the subcostal is unusually remote from the costal margin, and

there is on the under side a fringe of fine hair from the costal area extending to the middle of the cell; in others there is a dense tuft below the median vein near its end; secondaries with 3 and 4 from one point at the end of the median, 5 from the cell well removed from 4, but joined to the median by a faint curve, weaker at base than toward margin where it is nearly as strong as the others; in the males of some species there is a flat tuft of hair from the subcostal area near its middle, extending halfway across the cell beneath and there may be also a small hair tuft on vein 5 near its base. In shape the primaries are trigonate, with well defined apices, oblique arcuate outer margin and gently convex inner margin.

The most characteristic feature of the genus is the oblique palpi which extend well beyond the front, apparently straight out in continuation of the frontal tuft, but in reality oblique from the base to the end of the long second joint which is thickened from the upper surface by a massing of scales until the straight or slightly dropping third joint forms a straight line back to the frontal tuft.

The species are generally similar in appearance and maculation, except for *pyralis* and *geometralis*, which are broader winged and with a somewhat different scheme of ornamentation, extending across the secondaries. It is not improbable that some day the genus will be restricted to these two species, and that the balance of the species will be found to be worthy of a distinct generic term.

Pyralis and *geometralis* also differ by secondary characters of the male. This has the posterior tibiæ tufted, thickened and somewhat distorted, and at the base of the abdomen a double hair pencil or tuft. The primaries have an oblique tuft of erect hair extending along the middle of the wing on the under side. In both species the t. p. line is angulated on vein 7, and from that point is evenly oblique to the inner margin. There is an obvious median line and that is parallel with the t. p. line throughout, even to the angulation. The t. p. line is continued across the secondaries and so is the series of s. t. spots.

Pyralis is lemon-yellow to the t. p. line on both wings, and beyond that it is chocolate-brown. At the angulation of the t. p. line on primaries the brown shade does not follow the line but extends to the apex so that there is a continuous, evenly oblique dividing line from apex of primaries to the middle of the inner margin of secondaries on the spread insect.

Geometralis is uniformly chocolate brown, with exactly the same markings as the preceding. Usually the space beyond the t. p. line is a little darker than the basal area, and sometimes there is a distinct yellowish tinge, leading to the belief that after all we have only a well marked race or variety rather than a species distinct from *pyralis*.

Both sexes of both forms occur, however, and my material has not been large enough to warrant me in making the union definitely.

Habitalis, *incusalis* and *reversalis* agree in having the middle tibiae of male thickened, a little distorted and with a tuft of long hair. In addition, the wings on the underside are provided along the costal vein with fine hair which extends over and partly across the median cell. On the primaries this is rather an even fringe, while on the secondaries it is a narrower, flat tuft, which is triangular in outline and drawn out to a point. There is also a basal hair pencil at each side of the abdomen, similar to that in the preceding species; but the tufts are not quite so conspicuous.

Habitalis has a conspicuous dark reniform, very even pale median lines, and a punctiform s. t. line; the t. p. and s. t. lines tending to extend across the secondaries. It is a small species, almost uniformly luteous red-brown in ground color.

Reversalis is somewhat larger, greenish gray, with olivaceous darker shadings, the median lines dark and diffuse and the reniform not conspicuous. The secondaries are smoky, with the t. p. and s. t. lines traceable. Altogether the species does not in the least resemble the preceding and is not much nearer to the following.

Incusalis is a brightly marked form, varying in ground from yellowish to creamy-gray and even to reddish gray. The median lines are almost always distinct, usually black and shaded with black or brown toward the centre so that occasionally the median space is solidly dark filled. There is every intergrade between the two so that there is room for pretty series. The t. a. line is outwardly oblique, nearly rigid; the t. p. is nearly straight to the middle then sharply incurved so as to leave a usually well defined angle. The reniform is inconspicuous or altogether wanting.

None of the other species have secondary sexual modifications of any kind so far as observed, except that in some the antennæ are more obviously ciliated than in others.

Two species have the median lines rigid, oblique, subparallel, the

t. p. line extending in a straight line from costa to inner margin and vaguely across the secondaries as well.

Parallela is the larger, redder form, with the median lines conspicuously pale, the reniform wanting, and the s. t. line scarcely traceable.

Immaculalis, of which *obliqualis* is a synonym, is small, more yellowish-gray, powdery, with the median lines much less conspicuous, the t. a. tending quite markedly to be only half length, while the linear reniform is always at least traceable. There is an obscure s. t. line which varies greatly in the specimens, but is usually traceable.

Punitalis stands alone in this series by its large size, powdery, luteous red-brown color and general resemblance to *geometralis*. It is the only species here in which the median shade is obvious or even traceable on primaries, and the t. p. line is subangulate on vein 7. The presence of a punctiform orbicular is another point of resemblance to the preceding and different from all the following species.

Rectalis stands alone among the smaller species by its almost obsolescent reniform, very even median lines which are not incepted by black or dark costal spots, and the general almost uniform pale leather-brown color.

All the rest of the species have the reniform well marked or even conspicuous, and the median lines more or less obviously incepted by costal black or dark spots.

Secundalis and *finitima* have the surface of the primaries obviously powdery, the reniform while distinct is not contrasting, and the s. t. line is continuous, preceded by a more or less obvious darker shading.

Secundalis is the larger, more coarsely powdered species, dull gray in color, the median lines diffuse and the veins outwardly dark marked so as to be defined against the ground.

Finitima is smaller, much more variable in ground, ranging from light ashen gray to yellowish and rusty reddish, the median lines not diffuse and the veins not relieved against the ground color anywhere in the wing. The powdering of the primaries, while obvious as compared with the following species is much finer and more even than in *secundalis*.

Of the remaining species, *subflavidalis* resembles *finitima*, except in the lack of surface powdering and in the cleaner cut ornamenta-

tion. The reniform is rarely conspicuous, and the s. t. line is always continuous, irregular, preceded by a darker shade.

Historialis has the reniform conspicuously black, but without a defining ring or mark. The inception of the median lines is not conspicuous; but the lines themselves are complete, very even, the s. t. line obscure and more or less punctiform.

Tenalis looks like a small *historialis*, and has the same contrasting reniform. But the costal spots incepting the median lines are well marked or conspicuous, while the lines themselves are scarcely traceable or altogether obsolete. The s. t. line may be altogether wanting or may be fairly distinct and more or less punctiform.

Pleonectyptera noctuidalis Dyar has nothing to do with this genus, nor does *Cosymbia albocostaliata* which he has recently referred here belong to it, although he is correct in calling it a Noctuid.

In tabular form the species will divide as follows :

Posterior tibæ of male thickened and tufted; dense tuft on under side of primaries below cell. T. p. line angulated on vein 7, median shade distinct.

Primaries lemon-yellow to the t. p. line, chocolate-brown beyond.

pyralis.

Primaries uniform chocolate-brown..... **geometralis.**

Median tibæ of male thickened and tufted; wings of male with fringes or tufts of hair from costal vein across median cell.

Median lines even, pale; reniform conspicuous..... **habitalis.**

Median lines dark, t. p. angulated or sinuate; reniform not conspicuous.

Greenish-gray, shaded with olivaceous; lines diffuse; t. p. a little curved over cell, evenly oblique below..... **reversalis.**

Ashen to yellowish or reddish-gray; lines well defined; t. p. angulated at middle and deeply incurved below..... **incusalis.**

Legs of the male not modified in any way; no tufts on under side of wings.

Median lines pale, subparallel; t. p. line rigidly even, oblique from costa to inner margin.

Larger; redder; median lines conspicuously pale; reniform absent.

parallela.

Smaller; yellowish-gray; median lines not conspicuous; reniform linear.

immaculalis.

Median lines not subparallel; t. p. line more or less angled or outcurved over cell and incurved below, never rigidly oblique from costa.

Orbicular present, punctiform; t. p. line angled on vein 7; median shade line present..... **punitalis.**

Orbicular wanting; t. p. line not angulate; median shade line absent.

Reniform obsolescent; median lines not incepted by black or dark spots on costa..... **rectalis.**

Reniform well marked or conspicuous; median lines incepted by dark or black costal spots.

Primaries powdery; reniform not contrasting; s. t. line continuous.

Dull gray, powderings coarse; median lines diffuse; veins outwardly defined by dark scales.....**secundalis.**

Ashen to yellowish or reddish-gray; median lines not diffuse; veins not relieved**finitima.**

Primaries even in color, not powdery.

S. t. line continuous, preceded by dark shade; median lines clean cut.

subflavidalis.

S. t. line wanting or punctiform; reniform conspicuous, black.

Larger; median lines distinct; costal patches not conspicuous.

historialis.

Smaller; median lines usually lost; costal patches conspicuous.

tenalis.

Pleonectyptera pyralis Hubner.

1818. Hbn., Zutraege, 1, 23, f. 127, 128, *Hemeroplanis*.

1872. Grt., Trans. Am. Ent. Soc., iv, 23, *Pleonectyptera*.

1880. Grt., Can. Ent., xii, 87, *Pleonectyptera*.

1903. Holland, Moth Book, 246, pl. 29, f. 19, *Pleonectyptera*,
irrecta Walker.

1865. Wlk., Cat. Brit. Mus., Het., xxxiv, 993, *Poaphila*.

1893. Smith, Bull. 44 U. S. Nat. Mus., 362, pr. syn.
foccalis Zell.

1872. Zell., Verh. k. k., Zool.-bot. Ges., xxii, 47, pl. 1, f. 10, *Coptocnemis*.

1891. Smith, List Lepidoptera, 61, pr. syn.

1893. Smith, Bull. 44 U. S. Nat. Mus., 362, pr. syn.

Head and collar chocolate-brown, with intermingled gray-tipped scales. Thorax and abdomen bright yellow, the abdomen with a reddish or brown shading. Primaries yellow to the t. p. line and then beyond that line chocolate-brown, except that at the inward angulation of the line on vein 7, the brown shade continues on obliquely to the apex so as to form an almost even line from apex to outer third of internal margin. T. a. line brown, single, slender, a little outcurved and somewhat irregular in course. Median line distinct, brown, outwardly bent from costa to the reniform, then evenly oblique, parallel with the t. p. line to the middle of the inner margin. T. p. line slender, brown, outwardly oblique to vein 7, then abruptly bent and inwardly oblique to inner margin at outer third. S. t. line punctiform, outwardly marked with leaden gray scales, inwardly shaded with blackish, this in varying amount so as at times to become almost a continuous irregular band. Fringes darker brown. Orbicular small, brown, punctiform. Reniform brown, moderate in size, elliptical, not outlined. Secondaries yellow to a little beyond middle, then brown, continuing the brown shade of primaries obliquely across the wing. Median line of primaries also continued across secondaries at basal third, while the t. p. line crosses just within the brown outer shading. Beneath yellow, with rusty red-brown shades and powderings, both wings crossed by three blackish irregular lines, the outer broadest and inwardly diffuse; the primaries have the orbicular and reniform more distinctly marked than above. Expands 1.12-1.28 inches = 28-32 mm.

Hab.—Long Island to Florida and Texas; New Braunfels, Texas, in June; South Carolina, in June; New Brunswick, New Jersey, in July.

This is the most strikingly marked of all the species and is recognizable at a glance. The palpi differ from those of all save *geometralis* in that the terminal joint is shorter, less cylindrical and practically in line with the second joint instead of being directed forward and at an angle with it.

In the male the underside of the primaries has an oblique patch of somewhat stiff hair extending from the cell toward inner margin, the hair directed outwardly and upturned at its tip. Strictly there are two parts to this patch: one along the median vein directed into the cell; the other crossing the submedian interspace opposite the end of the median vein, the hairs directed outwardly.

The posterior tibiae of the male are irregularly dilated and excavated or grooved above, and toward base at the inner side of an enlargement a dense tuft or pencil of hair is attached. This structure is concealed by covering hair and scales when in position on the insect so that only a somewhat enlarged tibia is apt to be noted. The subapical spurs of this tibia are slender and weak, and there is apparently only one terminal spur.

At the base of the abdomen is a pair of pencil tufts; the larger and outer white, the smaller and inner blackish or dark brown. The first abdominal segment is composed of the dorsal sclerite only, and terminates abruptly at the sides. Attached to the lateral edges of this segment is a cup-shaped structure which bends around to the ventral surface. The opening of this cup is closed by an operculum of elastic tissue, which, apparently, can be extended and withdrawn at will. At the end of this operculum is a knob shaped structure to which the long hairs that form the outer pencil are attached. This pencil, fully extended, reaches to the end of the third abdominal segment. The groove into which this pencil fits and in which it is normally concealed does not extend much beyond the base of the third segment, so that the tip of the pencil is curved up at the tip when in place. At the base of this outer pencil and inside of its point of attachment is a smaller pencil of finer, dark hair which does not seem to be stalked. It is not recognizable as distinct from the outer tuft until the specimen is examined in liquid or in a very fresh example.

Finally, there is at the end of the abdomen a short retractile brush with round truncate tip, which may be withdrawn into a cavity opening at the end of the 7th abdominal segment beneath.

When extended it forms part of the anal tufting and escapes observation.

The male antennae are distinctly ciliated and the joints are furnished on each side with long single hairs or ciliae so that there should be absolutely no difficulty in distinguishing this sex.

Pleonectyptera geometralis Grote.

1872. Grt., Trans. Am. Ent. Soc., iv, 24, *Pleonectyptera*.

1893. Smith, Bull. 44, U. S. Nat. Mus., 362.

Ground color a uniform light chocolate brown. All the markings exactly like those of *pyralis*. Beneath: color and markings identical with those of *pyralis*. Expanse 1.20 inches = 30 mm.

Hab.—Staten Island, N. Y., Lahaway, in August; South Carolina, in June; Florida, in March.

The range of this species is the same as that of *pyralis*, of which I believe it to be a variety. The secondary sexual characters of the male are exactly identical. As both sexes of both forms are at hand, and I have no true intermediate forms, it is perhaps better to keep the species as distinct, until more material makes it possible to settle the question definitely.

Pleonectyptera habitalis Walker.

1859. Wlk., Cat. Brit. Mus., Het., xvi, 39, *Hypena*.

1893. Smith, Bull. 44 U. S. Nat. Mus., 363, *Pleonectyptera*.
phalaenalis Grote.

1882. Grt., Trans. Am. Ent. Soc., iv, 24, *Pleonectyptera*.

1893. Smith, Bull. 44, U. S. Nat. Mus., 363, pr. syn.

Leather-brown, varying only a little in depth of color. Head and collar with crimson scales. Primaries crimson along the costa. Median lines distinct, yellowish, a brown or crimson reddish line following in the t. a. and preceding in the t. p. line. T. a. line even, rigid, a little inwardly oblique. T. p. line even, oblique from costa to inner margin, almost parallel to t. a. line, with just a little in and outcurve below and above cell. S. t. line punctiform, smoky, marked with white scales outwardly. A series of dark terminal lunules which are sometimes scarcely discernible. Reniform of good size, blackish, kidney-shaped, quite well defined. Secondaries yellowish at base, darkening outwardly to or near to the ground color of the primaries. Beneath more yellowish, shaded with crimson, especially along the costal region of primaries and on secondaries. Both wings with a dark discal spot, a more or less complete extra median line and a broken or punctiform s. t. line. Expands .80-.92 inches = 19-23 mm.

Hab.—Texas, Florida, Alabama; Tybee Island, Georgia, July 28th; Tallulah Falls, Georgia, August 7th; "New York."

This species occurs throughout the Southern States not rarely, and into central Texas. The "New York" specimen is in my own

collection, without indication of its original source, and I am by no means ready to vouch for the locality; and yet Long Island might not be an improbable point of occurrence, and southern New Jersey is still more likely to produce it.

There is very little range of variation in the examples before me. There is a little difference in the shade of brown, due somewhat to age and condition and some difference in the distinctness of the median lines; but otherwise they all look very much alike.

In the secondary characters of the male the species is in general accord with the others of its section, save that the wing tufts of the under side are much less marked than described for *incusalis*, which in this respect is selected to illustrate the character; that on vein 5 of the secondaries is practically absent, and on the primaries the clothing is scarcely more prominent than in some species of the later section. The tuft from the costal area of secondaries is distinct and like that of *incusalis*, but smaller. The structure of the median tibiae is like *incusalis*, though when examined on the set specimen they seem only a little thickened and set with flat covering scales, which in fact conceal the tuft and excavation.

The abdominal tufting is characteristic and is figured for the series from this species. There is really a typical stalked pencil tuft concealed in an abdominal groove and a covering tuft attached at the sides of the first abdominal segment, and bent over so as to shield as well as conceal the groove containing the hair pencil. The covering tuft is re-inforced by a membranous shield inwardly, and it is completely to be moved aside to give freedom to the hair pencil. The first ventral (second actual) segment of the abdomen is a shield-like plate, and under its edges the stalk which carries the pencil is inserted.

The antennae of the male are ciliated, and the several joints have lateral, longer ciliae.

***Pleconectyptera reversalis* n. sp.**

Ground color greenish-gray; of primaries a little paler than of head and thorax. Maculation olivaceous. T. a. line rigid, inwardly oblique, well defined toward base, broad, outwardly diffuse. T. p. line yellowish, obscure, preceded by an olivaceous shade line which is inwardly diffuse; in course a little outcurved over cell, and very slightly incurved below. S. t. line broken, but scarcely punctiform; there are two dusky spots below the apex and then from vein 7 the line is continuous, bisinuate, hardly relieved against the s. t. space which is dusky to vein 6 from inner margin, but clearly defined against the terminal space which

is pale, except for an olivaceous clouding at middle. There is a series of dusky terminal lunules from which short interspaceal lines extend inwardly. The reniform is only a little dusky, moderate in size, lunate, not well defined. Secondaries dull yellowish, darker outwardly, with a dusky extra median shade; the outer margin and the abdomen with a coppery tinge. Beneath yellowish, outwardly and costally with coppery-red powdering; primaries with a dusky extra-median and s. t. shade line and discal spot; secondaries with similar but much less marked and incomplete brown lines. Expands 1 inch = 25 mm.

Hab.—Esper Ranch, Brownsvills, Texas.

One male in good condition from the collection of the Brooklyn Institute, taken by Mr. Schaeffer.

The lateral ciliation of the antennæ is much more obvious than in any other of the species, a single long cilia on each side of each joint appearing clearly under the lens, and this character will assist in distinguishing it from all the others. In the olivaceous and greenish-gray color and ornamentation it is also unique thus far. The secondary sexual tuftings of the underside appear to be in all respects like those of *incusalis*, and that applies to the tuftings at the base of the abdomen as well as to those on the wings.

Pleonectyptera incusalis Grote.

1881. Grote, Can. Ent., xiii, 133, *Bomolocha*.

1893. Smith, Bull. 44, U. S. Nat. Mus., 363, *Pleonectyptera*.

Ground color varying from pale gray to pale yellowish, more or less creamy in effect. Sides of palpi scarcely darker. Primaries with the median lines usually black, conspicuous, the t. a. outwardly, the t. p. inwardly diffuse, tending to fill the median space more or less solidly brown or blackish. T. a. line outwardly oblique with a little bend or angle in the submedian interspace, sometimes preceded by a narrow pale or even whitish shade line. T. p. line almost evenly oblique from costa to vein 4, then with a distinct incurve that gives the line a characteristic form; usually there is a narrow whitish or yellow outer edging to this line which merges into the s. t. space. S. t. line altogether wanting or, more usually, defined by a smoky s. t. shading that may be broken or continuous. There may be obvious terminal lunules, but more usually there is no trace of them. Reniform lost or only present as a dusky indication. Secondaries yellowish, a little darker and more brownish outwardly; sometimes with an extra median line. Beneath, pale lemon-yellow, primaries with a small discal spot and an incomplete extramedian line. Expands .95-1.05 inches = 24-26 mm.

Hab.—Arizona, Yuma County, in March and April; Yavapai County, May 2d; Phoenix, April 5th; California, Walters Station, in April; Colorado, without date or specific locality.

A series of seventeen examples, male and female shows a pretty range of variation in color and in the relative contrast of the median lines and space. In the course of the lines there is almost no varia-

tion and these are characteristic for the species. Only *subflavidalis* resembles it in the t. a. line, and none are like it in the course of the t. p. line.

The characters of the male are those of the series to which it belongs, and the abdominal tuftings are as described for *pyralis*. The venation figured is of this species, and the hair tufting is as shown in the picture. At the base of the primaries the tufting is of flattened hair and scales, and forms a little mass at tip; the longer hair from nearer the middle of costal margin is thin, fine and silky and forms a covering or shield over the veins of the costal area. On the secondaries the tuft comes from the membrane between veins 7 and 8, and consists of fine, thin, silky hair, forming two flattened layers; the outer much longer and tapering somewhat to a point. The little tuft on vein 5 is more scale-like and lies parallel with the vein when the wing is at rest; it is upright as shown in the figure when the wing is mounted and floats in a liquid medium.

The tufting of the legs is also drawn from this species. The median tibiae are somewhat inflated and grooved upward and inwardly; this groove concealing a tuft of long fine hair attached at the base. At the edge of this groove is a fringe of short, scale-like hair, which in part serves to close and protect it. The terminal spurs are very unequal. The hind tibiae are more nearly normal; but there is only a single terminal spur and there is a small hair tuft at basal third.

The antennae of male have the usual scant pubescence, and in addition each joint has an obvious lateral bristle on each side of each joint; not so distinct as in *reversalis* by any means; but yet readily noted.

The examples from Yuma and Yavapai Counties, Arizona, and from Walters Station, California, were all sent in by Mr. Hutson, and are from similar desert localities. The Colorado locality I know nothing about.

Pleonectyptera parallela n. sp.

Head and thorax reddish or fawn-gray, primaries more reddish. Head and thorax without markings, palpi gray tipped, more reddish basally. Primaries with the median lines almost parallel, rigidly oblique from costa to inner margin, broad, yellow, outwardly bordered by a narrow brown line or shade. There is no appearance of an s. t. line. No orbicular. No obvious reniform; but there is a vague shading at the end of cell which may indicate the occasional presence of this mark. Secondaries shading from pale yellowish at base to the reddish-

gray of primaries at outer margin, the t. p. line of primaries continued across the disc and scarcely less obvious; but this feature is probably variable and the line probably tends to become lost. Beneath: a more intense, almost rusty red, with the outer lines obscurely indicated. Expands 1 inch = 25 mm.

Hab.—Huachuca Mts., Arizona.

Two females, one in excellent condition, the other flown. It is an obvious ally of *immaculalis* Harv., but differs abundantly in the broader median line, the larger size, more robust form and entire absence of the s. t. line.

***Pleonectyptera immaculalis* Harvey.**

1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 13, *Pleonectyptera*.

obliqualis Hy. Edwards.

1886. Hy. Edw., Ent. Amer., ii, 171, *Pleonectyptera*.

Pale fawn color above, vermillion tinted beneath. The inner line faint on the primaries, the outer more distinct, pale red, with accompanying pale shade. Dots take the place of the s. t. line. One specimen shows minute superposed points replacing the reniform. Another has a more olivaceous tinting. Outside of the t. p. line the wing shows a faint darker line, and there is everywhere a slight powdering with fuscous.

The above is, in essentials, Dr. Harvey's description, and he allies it to *phalenalis*, differing by the want of the reniform. Mr. Hy. Edwards describes his species as follows:

"Very pale fawn-drab, with a pinkish tinge. The anterior line is discontinued a little beyond the middle, while the posterior is perfectly straight, and goes obliquely to the costa at about 3 mm. from the apex. Both these lines are bright chestnut-brown, though slightly indistinct, the space between them being paler than the rest of the wing. The submarginal line is composed of a broken series of dark brown spots, and there are also brown dots at the ends of the nervules. The secondaries have a faint indication of a median band. Beneath: both wings are stained with reddish, particularly towards the margins and the lower side of the abdomen; tibiae and tarsi are marked with the same color." Expands .80-.85 inches = 20-21 mm.

Hab.—Texas, March, April, July.

All the specimens that I have seen are from the Belfrage material. The Edwards' type is in the collection of the American Museum of Natural History in New York, and I have examples directly compared with it. In the United States National Museum is a series of specimens out of the type lot from which Dr. Harvey described, and in this series both the Harvey and Edwards descriptions are fully typified. The t. a. line tends to become lost above the middle, and the reniform varies all the way from a narrow line to a pair of dots or is lost altogether.

The males show no apparent secondary sexual characters, and the species is an easily recognizable one by the features just above emphasized.

Pleonectyptera punitalis n. sp.

Ground color a rusty reddish luteous, but ranging from smoky gray to almost leather-brown. Head and collar sometimes leaden or ash-gray. Wings with an irrorate or dusty appearance, giving the effect of a thin sealing. T. a line narrow, single, rusty brown or smoky, a little irregular and a little outcurved. T. p. line rusty or smoky, narrow, obscure, followed by an equally narrow and even less obvious pale line, oblique from costa at outer fourth to form an obtuse angle on vein 7, thence inwardly oblique, a little irregular to inner margin beyond outer third. A vague but usually traceable median shade line extends through nearly the middle of the median space, angulated like and nearly parallel with the t. p. line. S. t. line punctiform, spots black or smoky, more or less diffuse, sometimes with a few outer white scales, interspaceal and a little sinuate in the series. Orbicular a small dusky or blackish round dot. Reniform dusky or blackish, small, lunate, always obvious but never contrasting. Fringes concolorous, with sometimes a series of small rusty lunules at base. Secondaries much like the primaries in color, but may be either lighter or darker. Usually there is a traceable darker, narrow extra-median line and a small, vague discal lunule. Beneath: more intensely reddish or leather-brown and more powdery; usually with a trace of the maculation of upper side, sometimes almost immaculate. Expands 1-1.20 inches 25-30 mm.

Hab.—Arizona: Palmerlee, Cochise Co., Sept.; Huachuca Mts., July 30th, August; Yavapai Co., July 19th; Hot Springs, New Mexico, 7000 feet, August; Durango, Colorado, July 8-16th.

Five males and five females in fair condition, and I have seen others in collections. The species was collected by Skinner, Hutson and Schaeffer in recent years, and I found one example in the Hulst collection from New Mexico. It has a general resemblance at first sight to *geometralis*, and with that species I placed my first rubbed examples. The differences, however, are obvious, especially in the male, which lacks all the secondary characters of the older species.

Pleonectyptera rectalis n. sp.

Ground color light leather-brown or reddish over luteous, varying in tint. Primaries without strong contrasts, the median lines only being obvious. T. a. line upright, consisting of a narrow yellowish inner line and a broader, outwardly diffuse brown line which enlarges to a somewhat triangular mark on costa. T. p. line forming a small and very even outcurve over cell and an almost equal incurve below that point; consisting of a well-marked outer yellow line and a slightly broader inner brown line which is a little enlarged on the costa. S. t. line vaguely marked by a slightly darker shade, its course scarcely traceable, but apparently irregular and sinuate rather than angulate or dentate. A

series of very small obscure terminal dots visible in one example. Reniform traceable as a slightly darker undefined mark. Secondaries yellowish at base, becoming reddish outwardly. Beneath: dirty yellowish, costal and outer borders more reddish, with vague transverse indicated shadings in some specimens. Expands .92 inches = 23 mm.

Hab.—Arizona: Cochise Co., July 4th; Baboquivaria Mts., Pima Co., July 15, O. C. Poling; Colorado.

Two males and two females in fair to good condition. The two examples from Cochise Co. belong to the U. S. National Museum and are purchased specimens. The Colorado example is out of the old Hulst collection and has no data as to date, exact locality or collector.

The species is quite readily recognizable by the lack of any strongly marked characters and by the very slightly sinuated t. p. line; both lines starting from very feebly indicated enlargements on the costa.

The male shows no obvious sexual peculiarities on the wings, legs or abdomen; but the antennæ have the segments with longer lateral cilia.

***Pleonectyptera secundalis* n. sp.**

Ground color dull gray, powdered with coarse smoky brown, variable in amount. Sides of palpi dusky. Primaries with all the markings diffuse. T. a. line upright or a little inwardly oblique, edged with yellowish inwardly, outwardly smoky, diffuse. T. p. line only a little curved over the cell, well or even deeply incurved below it; outwardly a narrow yellow line, inwardly smoky, diffuse. The s. t. space is dusky beyond the t. p. line, darkening to the very irregularly angulate and dentate s. t. line which is defined by this dark shading, outwardly emphasized by white scales. Through this s. t. space the veins are obviously dusky and to a smaller extent this occurs also in the paler terminal space. A series of dusky terminal lunules in the interspaces. Reniform a kidney-shaped dark mark without definite outline and not strongly contrasting. Secondaries dirty yellowish from base to a distinct extra-median shade band, beyond which the wing is smoky. Beneath: yellow, more or less powdery; primaries smoky on disk and before the sharply defined s. t. line; also with a smoky extra-median line and a lunate discal mark; secondaries with a narrow median line, a diffuse outer band and a small discal spot. Expands 1.08-1.12 inches = 27-28 mm.

Hab.—Plumas Co., California, May 1st; Los Angeles Co., without date.

Two males and one female; the former good, purchased examples; the later an old rubbed example collected by Mr. Coquillett over 20 years ago and received among a lot of *Bleptina* for determination.

The species is quite characteristic by its powdery surface, the sharply marked and irregular s. t. line and the general resemblance to the Deltoid genus *Bleptina*. There are no apparent secondary sexual characters on the wings or abdomen of the male.

***Pleonectyptera finitima* Smith.**

1893. Smith, Insect Life, v, 333, *Pleonectyptera*.

Ground color gray, with a reddish or yellowish tinge, ranging from ashen to almost brick-red and dull luteous. Palpi brown at sides. Primaries powdery to irrorate with minute darker scales that may tend to smoky or to reddish. Reniform dusky to blackish, contrasting, not outlined, more or less kidney shaped. Median lines double, consisting of a yellowish and a darker line, the latter from a trigonate costal patch following in the t. a. and preceding in the t. p. lines. T. a. line upright or a little oblique, rigid, even. T. p. line a little outcurved over cell and a little incurved below; the curves about equalling each other and a little variable in extent. Usually the wing is darker beyond the t. p. line, but it may extend absolutely concolorous to the outer margin. S. t. line irregular, punctiform, the points sometimes outwardly emphasized by white scales, a darker shade often connecting them more or less completely. A series of dark terminal lunules which may be quite distinct or scarcely traceable. Secondaries from pale smoky or yellowish at base to a lighter shade of the primaries at outer margin, with or without a traceable extra-median line. Beneath: pale, powdered with reddish, varying in tint and in amount until some examples are uniform powdery brick-red. Usually there is a distinct discal spot, an extra-median line and sometimes an s. t. shade; but any one of these may be missing on primaries and on secondaries all may be absent. Expands .88-1.05 inches = 22-26 mm.

Hab.—California: March 21st; Los Angeles Co., July and October; Argus Mts., April; Pasadena, June 20th; Plumas Co., May 1st. Claremont, Colorado, without date or specific locality.

This seems to be among the more common forms and is quite widely distributed. The powdery appearance is characteristic and identifies the species in all its forms. The range of variation is in the relative distinctness of the marks, lines and spots and in the color of the suffusion. There is also a greater range in size than is usual in the species of this genus. There are no obvious tuftings on the wings, legs or abdomen of the male, and the antennæ are but feebly fringed with just noticeably longer hairs on each side of each joint, and these indeed are scarcely to be made out in some examples.

In the series before me four males and eight females are represented; two or more examples having been also used up to make slides illustrating venation, etc.

Types of the species are in the U. S. National Museum and in my own collection.

Pleonectyptera subflavidalis Grt.1881. Grote, Papilio, i, 166, *Megachyta*.1893. Smith, Bull 44, U. S. Nat Mus., 363, *Pleonectyptera*.

Ground color creamy gray, with a more yellowish tinge in primaries. Median lines inepted from trigonate blackish spots. T. a. line outwardly oblique, with a slight incurve, consisting of a paler inner and a darker, smoky and yellow outer portion, the latter out of the costal spot. T. p. line with an even out and equal or greater incurve; consisting of a pale inner portion, which is emphasized by the costal spot and a darker, olivaceous outer portion which tends to shade into the s. t. space, which darkens as it approaches the inner margin and at the s. t. line. S. t. line distinct, irregularly denticulate, with paler scales following the sharp dark edge. A series of small blackish terminal dots. Reniform dusky, obscure, lunate, not defined. Secondaries yellowish at base and to a dark outer shade line, beyond which the outer border is darker. Beneath: yellowish, ranging from almost immaculate to a powdery reddish on which the maculation of upper side is vaguely reproduced. Expands .92-1 inch. = 23-25 mm.

Hab.—Southern Arizona, in May; Claremont, California, with-out date; Los Angeles Co., California.

The type is in the Neumoegen collection, and I have a good compared pair before me at present. The maculation is almost exactly like *incusalis* in t. a. line; but the t. p. line is not angulate and the reniform is obvious. From *finitima* it is distinct by the course of the t. a. line and by the lack of powdering on the primaries. With the male at hand discrimination is easy, because it lacks the wing and abdominal tufts of *incusalis*, while it differs from that and *finitima* as well by having single longer cilia on each side of each antennal joint. The species occurs within the range of both those with which I have compared it, and it is not improbable that examples are mixed in collections with one or both. It is quite easy to lose a female in either series.

Pleonectyptera historialis Grt.1882. Grt., Can. Ent., xiv, 188, *Pleonectyptera*.

Ground color pale leather-brown over luteous. Palpi darker brown at sides. Primaries with reniform black, contrasting, of good size, kidney shaped, margins not defined. Median lines quite distinct. T. a. line upright or a little oblique, rigid, consisting of a narrow yellow inner and an equally narrow outer blackish or brown line, the latter from a somewhat enlarged spot on costa. T. p. line only a little sinuate, even, composed of an inner dark line from an enlarged costal spot, and an outer yellowish line; neither very clean cut or contrasting. S. t. line very obscure, marked by a darker s. t. cloud and somewhat irregular. A series of obscure brown terminal lunules. Secondaries pale yellowish or smoky at base, becoming brown toward the outer margin beyond an extra-median dusky line. Beneath: tending to brick-red, powdery, more yellowish at base and along inner margin. Expands 1.05-1.12 inches = 26-28 mm.

